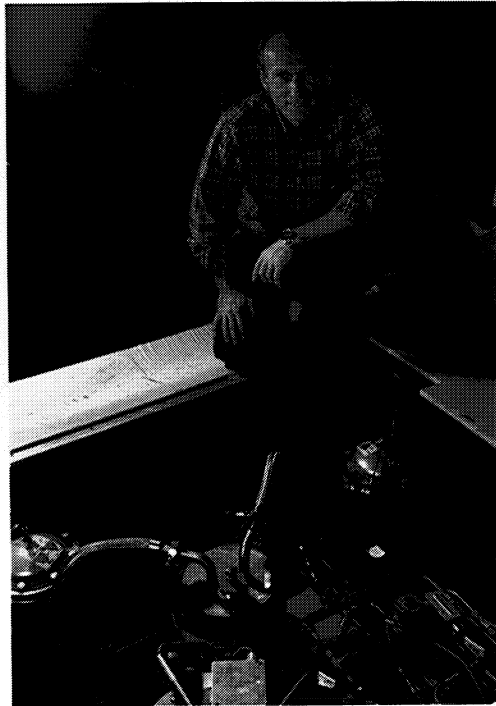


**A**rgonne (Illinois) National Laboratory is a multidisciplinary research center with primary focus on engineering research, particularly in nuclear power; basic science; and biological and environmental science and technology. It is among the world's most advanced scientific/technological facilities, but even so sophisticated a center can benefit on occasion from spinoff technology.

Donald E. Bohringer, Argonne engineering specialist, employed NASA information in two projects associated with the laboratory's Intense Pulsed Neutron Source (IPNS) facility. The IPNS is a powerful source of pulsed neutron beams for studies of the atomic and molecular structure of solids and liquids. It produces neutrons by firing accelerated protons at a uranium target. The NASA technology Bohringer employed involved improved vibration protection for a gamma ray detector in one project and, in the other, new leak detection technology. The IPNS and other Argonne facilities have many vacuum and pressure vessels and early detection of leaks

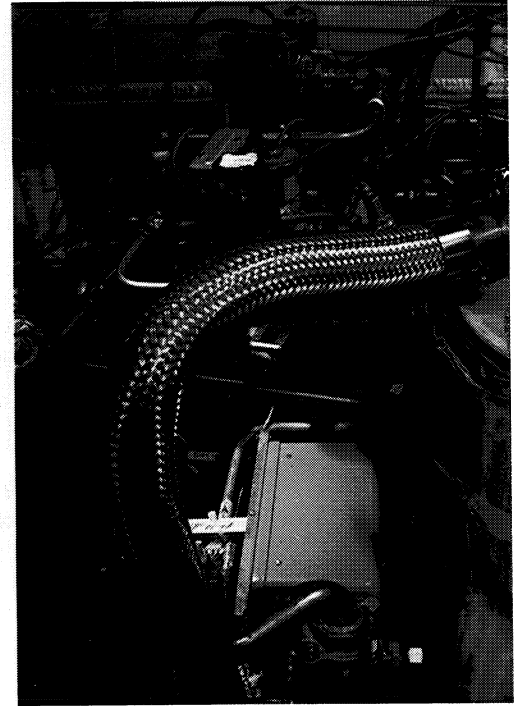


is highly important; the NASA information supplemented Argonne's own leak detection technology. Bohringer learned of both items in *Tech Briefs*, a NASA publication that informs potential users of technology available for transfer.

Bohringer read in *Tech Briefs* that NASA's Jet Propulsion Laboratory (JPL) had developed a package for gamma ray detectors that protects the detector's semiconductor crystal and isolates it from shock and vibration. He was interested in this development because the IPNS has two gamma ray detectors, located in the uranium target cooling system,

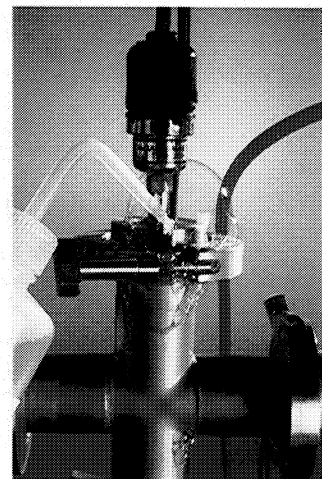
subject to vibration effects. He requested and received a Technical Support Package that provided detailed information, including a complete construction design, about the JPL development. It helped him develop a modified mounting system for the detector that combined the JPL design with Argonne innovation.

At left above, Bohringer perches on the thick wall of the uranium target cooling



system housing; in front of him is the gamma ray detector, exposed to view during a maintenance period when the huge concrete/lead shielding blocks that cover the cooling box during operation were removed. The detector (tan box) is shown in closeup above.

Bohringer used another *Tech Brief* lead relative to soap-solution leak testing, a technique widely employed in aerospace and other industrial operations. It involves brushing a soap solution on the joint to be tested while the vessel contains helium under pressure; if no bubbles appear, it is assumed that the leakage, if



any, is acceptably low. But exactly how low had never been quantified until Marshall Space Flight Center conducted an extensive research study and produced a document describing the minimum leak rate to which soap solution detection is sensitive. The minimum turned out to be less than one-tenth the previously assumed minimum rate.

At left, Argonne chief technician David Leach is demonstrating a soap solution leak detection test in a system pressurized with helium; in the closeup above the bubbles identify leak areas that need attention. ▲